manner, as regards both their positions and forms, while the student of Jupiter occupies himself in taking transits of the various spots visible in order to ascertain the rotation periods of objects situated in different latitudes. The rotation period of Mars is much more exactly known than that of any other planet (the earth excepted), and Prof. Bakhuyzen's value for this is 24h. 37m. 22·66s., deduced from 220 years' observations.

It seems desirable to note the accurate times when certain well-defined objects on Mars cross the central meridian in order to test the correctness of the ephemeris (*Monthly Notices*, June, 1902). Such transits will be most precisely obtained by micrometrical measurement. The particular forms, relative prominence and positions of the various dark and bright markings require further careful record, and must always be regarded as the most important aims in the observational study of this object. A large number of excellent charts of Mars have been published affording a useful means of comparison, but the observer need feel no disappointment should he fail to discern the supposed double canals, the oases, or the thick network of interlacing lines which eminently distinguish some of the drawings and impart a very singular aspect to Martian topography. With the planet's diameter apparently very small, as at present, no observer can expect to secure comprehensive views of detail.

For obvious reasons the transit times of spots on Mars cannot be determined with the same accuracy as those of Jovian markings. The small disc of Mars, and its comparatively slow rate of axial motion, are responsible for this. In one hour rotation carries the surface of Mars through only 14°·62, whereas on Jupiter the value is 36°·7. At intervals of about forty days the various features on Mars are presented at nearly the same times as before. Early in March that conspicuous marking known as *Syrtis Major* was favourably displayed in the evenings, and it will be similarly well seen near the middle of April.

W. F. Denning.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

Dr. Alexander Paine, of the Jenner Institute, has been appointed lecturer in bacteriology at the Bedford College for Women.

Dr. Bleibtreu, of Bonn, has been appointed to the chair of physiology at the University of Greifswald in succession to the late Prof. Landois.

The authorities of the Clark University, Worcester, Mass., have arranged again this year to hold a summer school from July 13–July 25, where university students, teachers, lecturers in pedagogy, and others may take courses of work in psychology, biology, pedagogy, and anthropology. The lectures and demonstrations will be under the direct supervision of President G. Stanley Hall and other professors of the University.

A telegram through Laffan's Agency from New York, dated March 28, states that Mr. Carnegie has presented an additional 310,000*l.* to the Carnegie Institution at Pittsburg, bringing up his total donations towards the cost of the buildings and their endowment to 1,570,000*l.*, exclusive of the 400,000*l.* given for branch libraries of the institution, for fossil excavations in Wyoming, and for other purposes. In addition to this, Mr. Carnegie has promised from 600,000*l.* to 1,000,000*l.* for a new technical institute.

In a recent paper read before the Society of Arts on "Education in the Netherlands," Mr. J. C. Medd remarks that in Holland "few things in recent years have been more striking than the development in nature-study. It is taught universally in schools of every grade, urban and rural, for its great educational value in developing certain faculties, especially those of observation, quite apart from its value as a preparation for science, or in its possible relation to rural pursuits. . . . Text-books are seldom used. Plants and flowers, gathered by the children themselves, are studied objectively, and their structure explained."

The calendar for the session 1902–3 of the University College of Sheffield provides numerous interesting facts concerning the work of the college. For instance, the new endowment fund started in 1895, and the scheme of which was later enlarged when, in 1897, the original Firth College was constituted by Royal Charter a university college, has now reached about 42,000*l.* The calendar shows that the scattered and inadequate nature of the buildings has long been a serious hindrance to the college. Funds have been raised towards the erection of new buildings on a single site for the whole college, and it is hoped a beginning will be made during the current session. Further donations for this purpose are much needed.

The first volume of the report of the U.S. Commissioner of Education for the year 1900-1901 contains, as usual, a great wealth of material for the student of educational problems. It is impossible here even to enumerate the articles contained in the 1216 pages which the volume contains. Among those of more immediate interest to readers of Nature may be mentioned the Commissioner's introduction; the review of education in Central Europe—in which due prominence is given to university and technical education; the account of the International Association for the Advancement of Science, Arts, and Education; the address of the director of the U.S. Geological Survey on the relations of the national Government to higher education and research; the Carnegie Institution of Washington, with a list of the most notable gifts of money by Mr. Carnegie for libraries and other educational purposes—this list shows that Mr. Carnegie has given away in this manner more than thirteen millions sterling; and the chapter on higher commercial education. There can be no doubt the Bureau of Education is not only assisting American education by the issue of these reports, but that of all the great countries of the world.

The retirement of Sir William Abney from the principal assistant-secretaryship of the Board of Education, South Kensington, was marked on Tuesday by the presentation to Lady Abney of his bust in bronze, the work of Prof. Lautéri. Sir John Gorst made the presentation, and in the course of his remarks he referred to the great influence Sir William Abney has exerted upon educational progress in this country. The bronze bust presented to Lady Abney is a token of the esteem in which Sir William Abney is held by his colleagues and a mark of regret at his retirement. The valuable work now being done in schools of science owes its initiative almost entirely to Sir William Abney, who is responsible for the development of scientific instruction in schools since he took charge of the work of the old Department of Science and Art. With a man like Sir Wiliam Abney at the head of affairs, proper provision was secured for the study of science in schools under his control, and the work of these schools has forced other secondary schools to find a place in the curriculum for rational scientific instruction. It is impossible to estimate the great influence which Sir William Abney has thus exerted upon scientific education in this country, but all who know his work understand that his retirement deprives science of one who has always promoted her educational interests.

SOCIETIES AND ACADEMIES.

London.

Royal Society, March 5.—"The Electrical Conductivity of Solutions at the Freezing Point of Water." By W. C. D. **Whetham**, F.R.S.

The paper contains an account of experiments which bring to greater concentrations a series of measurements on the conductivities of dilute solutions at the freezing point, communicated to the Royal Society in February, 1900.

The earlier experiments were conducted in a platinum cell, with the object of eliminating any solvent action of glass. Any such action would be quite inappreciable at the concentrations used in the experiments now to be described; resistance cells of glass were consequently used, and the labour of observation was much reduced.

The measurement of the electrical resistance was performed exactly as in the earlier set of experiments. The current from one or two dry cells was alternated by means of a revolving commutator, which was driven by a hand wheel and cord, the connections of a D'Arsonval galvanometer being simultaneously alternated by the same instrument. The alternating currents were passed through a Wheatstone bridge, in one of the arms of which was inserted the electrolytic cell.

In order to obtain the most probable results for the ratio of the equivalent conductivities to their values at infinite dilution, curves were drawn on squared paper between $m^{\frac{1}{3}}$ and k/m, and the smoothed readings taken at the required places. It is usual to call this ratio the coefficient of ionisation, but at the high concentrations here dealt with, we cannot assume that it really gives the fraction of the number of the molecules which is at any moment ionised; in the light of probable changes in the ionic fluidity of the liquids, and of the possible existence of complex ions, such an assumption is clearly unjustified. For the sake of convenience, the results previously obtained, as well as those of the experiments now described, are tabulated as the equivalent conductivities at 0° referred to the limiting value as unity.

In the earlier set of experiments, approximate values only were obtained for the absolute equivalent conductivities. From the values of the constants of the glass cells now used, it is possible to calculate throughout the whole range of concentration of both sets of observations the exact equivalent conductivities of the salts investigated.

Geological Society, March 11.—Prof. Charles Lapworth, F.R.S., president, in the chair.—Petrological notes on rocks from Southern Abyssinia, collected by Dr. Reginald Kœttlitz, by Dr. Catherine A. **Raisin**. The specimens were collected on an expedition (in 1898–99) starting from Berbera, westward through Somaliland and Southern Abyssinia, and turning northward to the Blue Nile. The crystalline rocks include granite, gneiss, and hornblende-schist or foliated diorite, together with more basic types. Some of the gneisses exhibit pressure effects. The more basic types include diabase, hornblende-gabbro, and one lustre-mottled hornblende-pyroxenite, resembling a picrite. The sandstones (chiefly from Somaliland and the south-east of Abyssinia) are sometimes compacted into quartzites, and are often ferruginous. Some of the limestones are concretionary, others dolomitic, and several from different localities are fossiliferous, containing at Jigjiga Pass Turritella in great numbers. The volcanic rocks include one which is practically a limburgite, many basalts, various less basic volcanic rocks and several pumiceous tuffs. But the most interesting are the phonolites and allied rocks, containing nepheline, riebeckite, or other alkaline minerals. The specimens here described may form a connecting-link between the volcanic rocks of other East African localities.—The overthrust Torridonian Rocks of the Isle of Rum and the associated gneisses, by Mr. Alfred **Harker**, F.R.S. The chief conclusions which the author wishes to establish are:—(1) That the highly disturbed region of the north-west Highlands, already known to extend into the south-eastern part of Skye, is further prolonged into the Isle of Rum. (2) That at numerous places along the disturbed belt which borders the principal mountain-group of the island, the Tertiary plutonic intrusions assume the character of well-banded gneisses, comprising alternations of different lithological types. (3) That these complex gneisses were formed mainly by fluxion in a heterogeneous mass, the heterogeneity being due to the inclusion and incorporation in a granitic magma of relics of ultrabasic and basic rocks.

Zoological Society, March 17.—Mr. G. A. Boulenger, F.R.S., vice-president, in the chair.—Mr. Oldfield **Thomas** exhibited the skin of a monkey from Kwei-chow, China, which appeared to represent a new species of Rhinopithecus. Mr. Thomas also exhibited adult and young examples of a new bush-duiker from British East Africa, which he proposed to call *Cephalophus ignifer*.—Mr. J. T. **Cunningham** read a paper in which were described experiments he had made on two cocks of the long-tailed Japanese fowls in his possession, to ascertain what effect the artificial treatment asserted by some to be practised by the Japanese fanciers would have. The two birds had been hatched on the same date, January 13, 1901. One of the birds was left to nature, except that the tail was tied up in paper when the bird was at liberty, to keep the feathers from injury. In this bird the longest feather was 2 feet 4½ inches in length in 1902, and growth ceased in March, and the feathers were moulted normally in the following autumn. In the other bird the feathers were stroked every day between the finger and thumb, so as to pull slightly on the roots. In this specimen growth continued until the middle of July, and a length of more than 2 feet 9 inches was attained in some of the feathers of the first adult plumage. The author considered still more important the fact that ten of the feathers came out under the treatment, and that successors to these immediately grew again, and continued to grow through and beyond the following moulting season. The author concluded that the great length of feather and suppression of the moult were produced by the Japanese fanciers in the same way, by thus stimulating the feathers and extracting them when or before they had completed their growth.—A communication was read from Sir Charles **Eliot**, K.C.M.G., in which two new genera (Ceratophyllidia and Pleurophyllidiella) and five new species were described, and notes given on some already known forms.—Mr. W. P. **Pycraft** read a paper on the osteology of the Cuculiformes = Cuculidæ + Musophagidæ, in which he showed that the isolated position which this suborder held among the Coraciomorphæ was as evident from a study of the osteology of the group as from other points of view.

MANCHESTER.

Literary and Philosophical Society, March 17.—Mr. Charles Bailey, president, in the chair.—Mr. J. Cosmo **Melvill** exhibited two letters written by Linnæus which had recently been rediscovered after being missing for more than eighty years, together with a Wedgwood plaque of Linnæus, given to him by Sir Joseph Hooker, with the information that it had been pronounced by Dr. Solander to be "a better likeness of his master than any ever painted."—Prof. W. Boyd **Dawkins** exhibited a series of mammalian remains from a cavern at Doveholes, near Buxton. He said that the remains belonged to the Pliocene age, and that this was the only cave in Europe which had yielded remains of that period.

PARIS.

Academy of Sciences, March 25.—M. Albert Gaudry in the chair.—On Abelian functions with complex multiplication, by M. G. **Humbert**.—A study of the combination of carbonic acid with potassium hydride, by M. Henri **Moissan**. The formation of potassium formate from potassium hydride and carbon dioxide has been indicated in a previous paper; it is now shown that the presence of a trace of moisture plays an important part in this synthesis. With perfectly dried materials, there is no reaction under a temperature of 54° C., but the amount of water vapour given off by ice at −85° C. is sufficient to start the reaction, and in presence of moisture the reaction is practically independent of the temperature.—On the physiological causes which determine the constitution of the mollusc type, by MM. Edmond **Perrier** and Ch. **Gravier**.—On the seat and the nature of the hypnagogic images, by M. Yves **Delage**. The question as to whether the hypnagogic images are retinal or cerebral has been much discussed; the author proposes a simple criterion; these images are retinal if they follow the movements of the eyes, or cerebral if they do not. From an experimental study the conclusion is drawn that the former is the case.—On waves in the midst of a vitreous medium affected with viscosity and very slightly deformed, by M. P. **Duhem**.—On a new kind of light, by M. R. **Blondlot**. It has been shown in previous papers that the radiation from a focus tube, filtered from light rays by passing through a thin sheet of aluminium or black paper, proves to be polarised when examined with a small spark, and the plane of polarisation is rotated by quartz or sugar. It has now been found that a rotation of the plane is also produced when the rays are passed through a Reusch mica pile. A single sheet of mica produces elliptical polarisation, thus indicating that these rays are liable to double refraction. But if this is the case, there should also be simple refraction. Using a small spark as detector, the refraction of these rays by a prism was clearly made out, and an attempt to concentrate the rays by means of a quartz lens was also successful. These effects cannot be due to the X-rays, since the latter undergo neither refraction nor reflection. These results indicate the existence of a new set of radiations emitted by a Röntgen tube; these rays pass through aluminium, paper, wood, are rectilinearly polarised on their emission, are susceptible of both rotatory and elliptical polarisation, can be reflected and refracted, but produce neither fluorescence nor photographic action.—The catalytic decomposition of ethyl alcohol by finely divided metals: the regular formation of aldehyde, by MM. Paul **Sabatier** and J. B. **Senderens.** The action of reduced copper, nickel, cobalt, and platinum upon alcohol has been studied at varying temperatures. With copper at about 300° C. the alcohol is split up into hydrogen and aldehyde without any secondary reactions. With the other metals the primary reaction would appear to be the same, but the aldehyde is attacked, methane and carbon monoxide accompanying the hydrogen.—On the spectrum of the comet 1902 *b*, by M. A. **de la Baume-Pluvinel.** Owing to the very feeble luminosity of the comet a special arrangement of apparatus was required in order to obtain a photograph of the spectrum, but a negative was finally obtained on October 24 sufficiently good for measurements to be taken. The wave-lengths found are referred to the carbon spectrum, hydrocarbon and cyanogen.—Propagation in conducting media, by M. Marcel **Brillouin.**—On the sub-salts of barium, by M. **Guntz.** By fusing the haloid salts of barium with sodium, compounds of the formula BaXNaX, where X represents the halogen, were obtained. Heated in a vacuum at 700° C., sodium is volatilised and the ordinary barium salt is left.—On methylmonobromocamphor, bromomethylcamphor and methylene-camphor, by M. J. **Minguin.**—On the hydration of the acetylene acids. A new method for the synthesis of non-substituted β-ketonic esters and acids, by MM. Ch. **Moureu** and R. **Delange.** The ordinary method of adding water to acetylene compounds by means of sulphuric acid or mercuric salts having given poor results, caustic alkalies were used with satisfactory results. A description is given of the preparation and properties of several ketonic acids synthesised in this way.—The action of phosphorus trichloride upon glycol, by M. P. **Carré.** The chief product is a compound $P_2.(O.CH_2)_4Cl_2$, the decomposition products of which with water have been studied.—The action of mixed organo-magnesium compounds on bodies containing nitrogen, by M. Louis **Meunier.** Ammonia with ethyl-magnesium iodide gives ethane and $NH_2.MgI$, and aniline, diazoamidobenzene and phenylhydrazine give analogous products.—On the pyrogallol-sulphonic acids, by M. Marcel **Delage.**—Remarks on the soluble ferments which determine the hydrolysis of polysaccharides, by M. Em. **Bourquelot.** The number of soluble ferments or enzymes is greater than is usually supposed; the intervention of the enzymes in the natural phenomena of hydrolysis is governed by relatively simple laws.—The existence of glycerine in normal blood, by M. Maurice **Nicloux.** By applying the method of estimation described in a previous note the author has been able to prove the existence of glycerine in normal blood in very small proportion.—On the mechanism of lipolytic actions, by M. Henri **Pottevin.**—A contribution to the study of the Diplozoa, by M. P. A. **Dangeard.**—On the existence and extension of the pith in the petiole of Phanerogams, by M. **Bouygues.**—On the origin of leaves and on the foliar origin of the stem, by M. Léon **Flot.**—On the dust which fell on February 22, by M. A. B. **Chauveau.** The dust probably came from the Sahara.—Remarks by M. **Mascart** on the preceding note.—On the physiology of the internal ear, by M. **Marage.** A reply to a note of M. Pierre Bonnier.—Experimental researches on the psychophysiology of sleep, by MM. N. **Vaschide** and Cl. **Vurpas.**

DIARY OF SOCIETIES.

THURSDAY, APRIL 2.

LINNEAN SOCIETY, at 8.—List of Marine Algæ collected at the Maldive and Laccadive Islands by J. Stanley Gardiner: Mrs. Gepp (Ethel S. Barton).—The Comparative Anatomy of Cyatheaceæ and other Ferns: D. T Gwynne-Vaughan.

CHEMICAL SOCIETY, at 8.—On the Absorption Spectra of Nitric Acid in Various States of Concentration: W. N. Hartley.—The Dioximes of Camphorquinone and Other Derivatives of *iso*Nitrosocamphor: M. O. Forster.—Salts of a Mercaptoid Isomeric Form of Thioallophanic Acid, and a New Synthesis of Iminocarbaminethioalkyls: A. E. Dixon.—Discoloured Rain: E G. Clayton.—Derivatives of *o*-Aminobenzophenone and *p*-Aminobenzophenone: F. D. Chattaway.

ROYAL GEOGRAPHICAL SOCIETY, at 4.—Geographical Education; with Special Reference to Globular Contoured Maps, Globes and Reliefs: Prof. E. Reclus.

RÖNTGEN SOCIETY, at 8.30.—Some Effects produced by Radiations: J. H. Gardiner.

FRIDAY, APRIL 3.

MALACOLOGICAL SOCIETY, at 8.—Additions to the genus Streptaxis: G. K Gude.—On a New Species of the genus Xylophaga from the English Coast: E. A. Smith.—Notes on some New or Little Known Members of the Family Doridiidæ: Sir Charles Eliot.—On a New Species of Cerastus from near Aden, with a Note on *Otopoma clausum*, Sby.: E.R Sykes.—Descriptions of Two Supposed New Species of Cyathopoma: H. B. Preston.—On Shells Floating on the Surface of the Sea: August Krogh.

ROYAL INSTITUTION, at 9.—Drops and Surface Tension: Lord Rayleigh.

GEOLOGISTS' ASSOCIATION, at 8.—The Geology of North Staffordshire (with Special Reference to the Whitsuntide Excursion): Dr. Wheelton Hind.—Coal Measures of North Staffordshire: Walcot Gibson.

SATURDAY, APRIL 4

ROYAL INSTITUTION, at 3.—Light: Its Origin and Nature: Lord Rayleigh.

MONDAY APRIL 6

VICTORIA INSTITUTE, at 4.30.—Modern Theories concerning the Composition of Holy Scripture: Rev. John Tuckwell.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Manufacture of Iodine from Nitrate Liquors: Dr. W. Newton.—New Modification of Coffignier's Prussian Blue Reaction, and a possible Application: Watson Smith.—The Explosion of Potassium Chlorate at St. Helen's: Dr. A. Dupré, F.R.S.

TUESDAY, APRIL 7.

INSTITUTION OF CIVIL ENGINEERS, at 8.—American Locomotive Practice: P. J. Cowan.

WEDNESDAY, APRIL 8.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Rotation Period of the Markings on Jupiter: W. F. Denning—Standard Scale for Telescopic Observation: Percival Lowell.—The Madras Observatory and its Work: Prof. Michie Smith.

GEOLOGICAL SOCIETY, at 8.—On the Probable Source of the Pebbles of the Triassic Pebble-Beds of South Devon and of the Midland Counties: O. A. Shrubsole.—Note on the Occurrence of Keisley Limestone-Pebbles in the Red Sandstone-Rocks of Peel (Isle of Man): E. Leonard Gill.

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